DOCUMENT RESUME

ED 283 604 PS 016 578

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TITLE Children's Effort/Ability Reasoning: Individual Differences and Motivational Consequences.
PUB DATE Apr 87
NOTE 13p.; Paper presented at the Biennial Meeting of the Society for Research in Child Development (Baltimore, MD, April 23-26, 1987).
PUB TYPE Reports - Research/Technical (143) -- Speeches/Conference Papers (150)

EDRS PRICE MF01/PC01 Plus Postage.
DESCRIPTORS Ability; *Adolescents; Attribution Theory; *Cognitive Development; Concept Formation; Failure; *Helplessness; *Individual Differences; Inferences; *Mastery Learning; *Motivation; Persistence
IDENTIFIERS *Developmental Patterns; Effort

ABSTRACT

Individual differences in same-aged children's reasoning about effort and ability, as well as the consequences of different forms of reasoning in actual achievement situations, were investigated. It was hypothesized that different forms of children's reasoning would be related to different (helpless versus mastery-oriented) motivational patterns. Research documented the existence of two distinct and essentially opposite forms of reasoning in young adolescents. One form, typically linked to developmental maturity, assumes that effort and ability are inversely related and asserts that effort discredits ability. The other form, typically ascribed to younger children, assumes a positive relationship between effort and ability and asserts that effort utilizes abililty. In two studies, 13- and 14-year-old adolescents' form of reasoning was a significant predictor of their motivational pattern, but "mature" reasoning led to the helpless pattern, whereas "immature" reasoning led to the mastery-oriented pattern. Results suggest that effort-ability reasoning may best be understood by considering both developmental and individual differences. (Author/RH)

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Children's Effort/Ability Reasoning:

Individual Differences and Motivational Consequences

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April, 1987

Paper presented at

the biennial meeting of the

Society for Research in Child Development

Baltimore, MD

ED283604

PS 016578

Abstract

Although previous research has revealed developmental differences in reasoning about the effort/ability relationship, little research has investigated (1) individual differences in effort/ability reasoning among same-aged individuals, and (2) the consequences of different reasoning in actual achievement situations. In the present research, it was hypothesized that different forms of reasoning would be related to different (helpless vs. mastery-oriented) motivational patterns. First, the research documented two distinct and essentially opposite forms of reasoning in young adolescents. One form, which is typically linked to developmental maturity, assumes that effort and ability are inversely related (effort discredits ability). The other form, typically ascribed to younger children, assumes a positive relationship (effort utilizes ability). In two studies, childrens' form of reasoning was a significant predictor of their motivational pattern, but inverse ("mature") reasoning lead to the helpless pattern, whereas positive ("immature") reasoning lead to the mastery-oriented pattern. Results suggest that effort/ability reasoning may best be understood by considering both developmental and individual differences.

Introduction

Much previous research has explored developmental change in reasoning about effort and ability. Studies have typically found that adolescents have differentiated the separate concepts of "effort" and "ability", and that they use inverse reasoning about the effort/ability relationship when making achievement judgments (i.e., higher effort implies lower ability). Younger children apparently have undifferentiated concepts of effort and ability, and are unable to use inverse reasoning. Instead, they typically make judgments of effort and ability that are positively related (i.e., higher effort implies higher ability) (see, e.g., Karabenick and Heller, 1976; Kun, 1977; Nicholls, 1978; Shaklee, 1976; Surber, 1980).

Although these developmental differences in reasoning abilities have been well-documented, little research has investigated 1) individual differences in effort/ability reasoning among same-aged individuals and 2) the consequences of different reasoning in actual achievement situations. The present research proposed first, that adolescents who are able to differentiate the concepts of ability and effort, may differ in their conceptions of the effort/ability relationship. More precisely, they may reason that effort and ability are inversely related, as developmental evidence suggests, or alternatively, they may reason that effort and ability are positively related. Thus, we may observe individual differences in preferred forms of reasoning among

adolescents. Second, it was proposed that when individuals make judgments about their own achievement outcomes, the use of each form of reasoning will have different (i.e., helpless vs. mastery-oriented) motivational consequences (see Diener and Dweck, 1978; Dweck and Elliott, 1983; and Dweck and Goetz, 1978 for discussions of these motivational patterns).

Specifically, it was hypothesized that each conception of the effort/ability relationship, when employed in a situation requiring effort, would result in different interpretations of that situation and its outcome. When the inverse form of reasoning (or inverse inference rule) is employed, high effort would be interpreted as a direct indication of low ability (effort discredits ability). A high effort failure, in particular, would be attributed to low ability, and decreased persistence would be predicted. In contrast, when effort and ability are seen as positively related (effort utilizes ability), high effort, even in the presence of a failure outcome, would not necessarily indicate low ability. High effort will more readily imply that one's ability is being activated towards solution of a difficult task, but that even more effort is required. To summarize, then, an inverse inference rule is predicted to result in attributions and persistence patterns typical of helplessness, whereas a positive effort/ability inference rule is predicted to result in the mastery-oriented motivational pattern.

Method

Procedure. To test the hypotheses of the study, adolescents aged 13-14 years of age were seen individually at school. To create a context similar to an actual achievement situation, participants were told that they would be working on some new "intellectual problems". They first completed a questionnaire measure designed to assess their typical way of reasoning about the effort/ability relationship. They then worked on two sets of novel concept-formation problems. The first problems, which were only moderately difficult, were used to train task performance and provided a success experience. The next problems were very difficult and provided a failure experience. Causal attributions were rated after the failure problems. As a measure of persistence, participants were then asked which of the two types of problems (success or failure) they would prefer to work on again in another session. An initial study and a replication were conducted.

Assessment of effort/ability reasoning. The measure was a forced-choice, questionnaire format consisting of 10 items. Each item contained two contrasting statements intended to pit the essence of the inverse relationship against the essence of the positive relationship. Sample items follow, with the inverse statement presented first for clarity. (The order was counter-balanced in the actual measure):

1.___ If you have to work hard at some problems, you're probably not very good at them.

___ If you have to work hard at some problems, you may be very good at them.

2.___ You only know you're good at something when it comes easily to you.

___ When something comes easily to you, you don't know how good you are at it.

3.___ When you're very good at something, you don't really have to work hard to understand it.

___ When you're very good at something, working hard allows you to really understand it.

Children were categorized as endorsing the inverse or positive inference rule based on a median-split of the cumulative scores (10 = extreme positive reasoning). Children with a score of 6 (which was the median in both studies) were not included in analyses. The resulting samples included 54 children (29 inverse, 25 positive) for Study 1, and 59 (26 inverse, 33 positive) for Study 2. It is important to note that the two groups did not differ in actual ability as assessed through achievement test scores, school grades or ease of training at the task.

Results

Individual differences in effort/ability reasoning were clearly apparent in both studies, and as hypothesized, preferred inference rule was a significant predictor of the two phenomena most characteristic of helpless and mastery-oriented motivational patterns: failure attributions and persistence.

Attributions. As noted in Table 1, 61% (Study 1) and 54% (Study 2) of those using the inverse rule made helpless attributions to inadequate ability, compared to 32% (Study 1) and 21% (Study 2) of those using the positive rule. By contrast, 60% (Study 1) and 76% (Study 2) of the children using the positive rule made mastery-oriented attributions to inadequate effort and strategies. A 2 (Positive vs. Inverse Rule) X 2 (Effort/Stragey vs. Ability) chi-square analysis was performed on the frequency data, and the group differences in failure attributions were found to be highly significant in both studies (Study 1, χ^2 (1, N=45) = 8.22, p<.005; Study 2, χ^2 (1, N=55) = 8.62, p<.005).

Persistence. As will be noted in Table 2, as predicted, 52% (Study 1) and 42% (Study 2) of those using the inverse rule chose to cease working on the difficult problems when they were given the opportunity to do so, compared to only 16% (Study 1) and 9% (Study 2) of those using the positive rule. A 2 (Positive vs. Inverse Rule) X 2 (Persist vs. Non-Persist) chi-square analysis revealed that that the group differences were highly significant (Study 1, χ^2 (1, N=54) = 7.51, p=.006; Study 2, χ^2 (1, N=59) = 8.87, p=.003).

Conclusions

In this study, children who were old enough to differentiate the concepts of ability and effort showed marked individual differences in the forms of reasoning they employed about the effort/ability relationship. Furthermore, children who employed reasoning typically associated with developmental maturity were found to exhibit maladaptive motivational tendencies, whereas those who employed reasoning typically associated with developmental immaturity exhibited adaptive motivational tendencies. These results highlight the importance of studying not only developmental differences in effort/ability reasoning abilities, but the consequences of different reasoning as well. Lastly, the results suggest that the two conceptions of the effort/ability relationship may best be understood by considering both developmental changes and individual differences.

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Table 1

Percentage of Children Using Each Inference Rule Who Ranked Each Failure Attribution as Most Important

	Attribution		
Inference Rule	Strategy	Ability	External
		Study 1[a]	
Positive Rule (Effort utilizes ability)	60	32	8
Inverse Rule (Effort discredits ability)	18	61	21
		Study 2[b]	
Positive Rule (Effort utilizes ability)	76	21	3
Inverse Rule (Effort discredits ability)	35	54	11

[a] X^2 (1, N=45) = 8.22, $p < .005$ (Strategy vs. Ability)

[b] X^2 (1, N=55) = 8.62, $p < .005$ (Strategy vs. Ability)

Table 2

Percentage of Children Using Each Inference Rule Who Persisted and Failed to Persist

Inference Rule	Behavior	
	Persisted	Failed to Persist
	Study 1[a]	
Positive Rule (Effort utilizes ability)	84	16
Inverse Rule (Effort discredits ability)	48	52
	Study 2[b]	
Positive Rule (Effort utilizes ability)	91	9
Inverse Rule (Effort discredits ability)	58	42

[a] χ^2 (1, N=54) = 7.51, $p < .006$, phi = .37

[b] χ^2 (1, N=59) = 8.87, $p < .003$, phi = .39